REMARKS

Claims 2, 4-11, 13, 15-22, 24, 26-33, 35, 37-44, 46 and 48-59 are pending with claims 4, 7, 9, 11, 15, 18, 20, 22, 26, 29, 31, 33, 37, 40, 42, 44, 48, 51, 53, and 55 being independent. Claims 1, 3, 12, 14, 23, 25, 34, 36, 45 and 47 were cancelled previously. Claim 56 has been cancelled by this amendment. Claims 9, 11, 20, 22, 31, 33, 35, 42, 44, 53, 55, 57-59 have been amended. No new matter has been added. Reconsideration is respectfully requested in view of the forgoing amendments and these remarks.

Interview Summary of July 11, 2006

Applicant thanks Examiner Phan for conducting the interview with Applicant's representative, Mr. Mark Kirkland. Argument was made that Applicant's claimed method that includes selecting different constellations for 2 or more of the active antennas is not taught or suggested by the prior art. See for example Kadous Column 14, Lines 6-10, Fig. 4, Columns 14-16. No agreement was reached.

Claim Rejections Under 35 U.S.C. 112

Claims 9, 11, 20, 22, 31, 33, 42, 44, 53, and 55 were rejected under 35 U.S.C. 112 as allegedly being indefinite for not defining all expressions and variables. Claims 9, 11, 20, 22, 31, 33, 42, 44, 53, and 55 have been amended. These claims have been amended to clarify the relationship of the equation to the apparatus, computer program, method or system as appropriate. Applicant notes with appreciation that claims 9, 11, 20, 22, 31, 33, 42, 44, 53, 55,

58, and 59 were identified by the Examiner as claims that would be allowable if rewritten or amended to overcome the rejections(s) under 35 U.S.C. § 112, 2nd paragraph. Applicant respectfully asserts that these claims are in condition for allowance.

Claim Objections

Claims 35 and 56-59 are objected to because of an informality. Claim 56 has been cancelled and claims 35 and 57-59 have been amended to obviate the contentions. Thus, withdrawal of these claim objections is respectfully requested.

Claim Rejections Under 35 U.S.C. 103(a)

Claims 2, 4-10, 13, 15-19, 21, 24, 26-30, 32, 35, 37-41, 43, 46, 48-52, 54 and 57 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent Publication number 2003/0223391 to Malaender in view of U.S. Patent number 6,801,580 to Kadous. Applicant respectfully traverses the rejections.

Claim 4

Claim 4 is directed to a method that includes selecting a subset of active antennas from a plurality of available antennas in a multi-element antenna system, and selecting a constellation for transmission on the active antennas including selecting different constellations for two or more of the active antennas.

Malaender is directed to a method and system for employing antenna arrays. In the method, techniques are described for adjusting a number of antennas to employ, the on/off

patterns for the antennas, and the eigenmode values (*See* Malaender Abstract). However, Malaender does not teach or suggest selecting a constellation for transmission on the active antennas including selecting different constellations for two or more of the active antennas. In fact, the Office Action concedes that "Malaender fails to expressly teach selecting a constellation for transmission on the active antennas where said selecting the constellation for transmission on the active antennas comprises selecting different constellations [for] two or more of the active antennas." *See* Office Action dated May 1, 2005 at pg. 3, l. 20 – pg. 4, l. 2. The addition of Kadous fails to alleviate the deficiencies of Malaender.

The Office Action alleges that Kadous discloses selecting the constellation for transmission on the active antennas comprises selecting different constellations for two or more of the active antennas at col. 17, ll. 40-59; figs. 5, cols. 16-18; col. 14, ll. 6-10; fig. 4; and cols. 14-16. However, the cited portions of Kadous fail to support the allegation.

Kadous is directed to "techniques to process a number of received symbol stream, using successive interference cancellation (SIC) processing, to recover a number of transmitted symbol streams." *See* Kadous at Col. 3, ll. 43-48. These techniques of Kadous can be implemented in various multi-channel communication systems, such as MIMO. *See* Kadous at Col. 3, ll. 48-50-55. Because Kadous is directed to merely processing a number of received symbol streams, Kadous does not vary the number of antennas or the constellations selected for the antennas. Kadous can only process the signal received from a set number of antennas using a predetermined constellation. *See,* Kadous at Col. 14, ll. 6-10. Thus, Kadous does not disclose or suggest selecting active antennas or selecting constellation for transmission on the active

antennas to include selecting different constellations for two or more of the active antennas as recited in claim 4.

The cited portions of Kadous disclose that "performance [of various SIC processing schemes] is provided for a (2,4) MIMO system with two transmit antennas and four receive antennas, and which uses **16-QAM** with rate 1/2 Turbo coding." *See* Kadous at Col. 14, ll. 6-10; FIG. 4 (emphasis added). Therefore, all of the antennas in Kadous use a single constellation, **16-QAM**. Further, Kadous is silent as to selecting different constellations for two or more of the active antennas (i.e., at least two different constellations for two antennas). Applicant's specification provides an example. "As a result of antenna and constellation selection, Antennas 1, 2, and 3 transmit a 16-QAM constellation for the linear and V-BLAST system. For the SCR system, Antennas 1 through 5 are active with transmit constellations 8-PSK, 8-PSK, QPSK, QPSK, and QPSK, respectively." Applicant's Specification at ¶ 52. Therefore, even if Malaender and Kadous could somehow be combined, which is not conceded, the combination would still fail to disclose each and every feature of claim 4. Accordingly, Applicant respectfully asserts that claim 4 as presented is allowable over the suggested combination of Malaender and Kadous.

Claims 2, 5, 6, 8 and 10 depend from claim 4 and are allowable for at least the same reasons set forth above with respect to claim 4.

Claim 7

Claim 7 is directed to a method that includes selecting a subset of active antennas from a plurality of available antennas in a multi-element antenna system where the selecting comprises

selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin.

Malaender does not teach or suggest Applicant's claimed method including selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin in a multi-element antenna system. In fact, the Office Action concedes that "Malaender fails to expressly teach where said selecting comprises selecting an optimum number of antennas to maximize a minimum signal-to-noise (SNR) margin. *See* Office Action dated May 1, 2005 at pg. 4, ll. 20-22. The proposed addition of Kadous fails to alleviate the deficiencies of Malaender.

The Office Action alleges that Kadous discloses the claimed features at col. 16, ll. 15-33; and cols. 11-16. However, the cited portions of Kadous fail to support the allegation. For example, the cited portions of Kadous disclose selecting the detected symbols stream with the highest margin, where the margin is determined as the difference between the equivalent SNR and the required SNR. *See* Kadous at Col. 16, ll. 15-33. Therefore, Kadous discloses selecting the symbol stream and not an optimum number of antennas as recited in claim 7. Merely selecting a symbol stream for recovery does not indicate that an optimum number of antennas has been determined. As described above, Kadous is merely processing the symbol streams received from N_T transmit antennas. *See* Kadous at Col. 3, ll. 48-50-55. Kadous cannot select an antenna or the constellation for the antenna. Kadous can only process the received symbol stream. Therefore, selecting the symbol stream in Kadous cannot reasonably be construed as selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR)

margin as recited in claim 7. Therefore, even if Malaender and Kadous could somehow be combined, which is not conceded, the combination would still fail to disclose or suggest each and every feature of claim 7. Accordingly, Applicant respectfully asserts that claim 7 is allowable over the combination of Malaender and Kadous for at least this reason.

Claim 15 and its dependent claims

Claim 15 should be allowable for at least reasons similar to claim 4. In particular, the proposed combination fails to teach or suggest, "[a]n apparatus comprising: a processor operative to select a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium, wherein the processor is operative to select a constellation for transmission on the active antennas and to select different constellations for two or more of the active antennas" as recited in claim 15 (emphasis added).

Claims 13, 16, 17, 19 and 21 depend from claim 15 and are allowable for at least the same reasons set forth above with respect to claim 15.

Claim 18

Claim 18 should be allowable for at least reasons similar to claim 7. In particular, the proposed combination fails to teach or suggest, "[a]n apparatus comprising: a processor operative to select a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium where the processor is operative to select an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin" as recited in claim 18 (emphasis added).

Claim 26 and its dependent claims

Claim 26 should be allowable for at least reasons similar to claim 4. In particular, the proposed combination fails to teach or suggest, "[a]n apparatus comprising: a processor including means for selecting a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium and means for selecting a constellation for transmission on the active antennas including means for selecting different constellations for two or more of the active antennas" as recited in claim 26 (emphasis added).

Claims 24, 27, 28, 30 and 32 depend from claim 26 and are allowable for at least the same reasons set forth above with respect to claim 26.

Claim 29

Claim 29 should be allowable for at least reasons similar to claim 7. In particular, the proposed combination fails to teach or suggest, "[a]n apparatus comprising: a processor including means for selecting a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium, where said selecting comprises selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin" as recited in claim 29 (emphasis added).

Claim 37 and its dependent claims

Claim 37 should be allowable for at least reasons similar to claim 4. In particular, the proposed combination fails to teach or suggest, "[a] system comprising: a propagation medium; a first transceiver including a plurality of available antennas; a second transceiver including a plurality of available antennas, a processor operative to determine higher-order statistics of the

propagation medium from signals received from the plurality of available antennas at the first transceiver; and an antenna selection module operative to select a subset of active antennas from the plurality of available antennas based on higher-order statistics of the propagation medium, where the processor is operative to select a constellation for transmission on the active antennas and select different constellations for two or more of the active antennas" as recited in claim 37 (emphasis added).

Claims 35, 38, 39, 41, and 43 depend from claim 37 and are allowable for at least the same reasons set forth above with respect to claim 37. Claim 56 has been cancelled to obviate the contention with respect to claim 56.

Claim 40 and its dependent claims

Claim 40 should be allowable for at least reasons similar to claim 7. In particular, the proposed combination fails to teach or suggest, "[a] system comprising: a propagation medium; a first transceiver including a plurality of available antennas; a second transceiver including a plurality of available antennas, a processor operative to determine higher-order statistics of the propagation medium from signals received from the plurality of available antennas at the first transceiver; and an antenna selection module operative to select a subset of active antennas from the plurality of available antennas based on higher-order statistics of the propagation medium, where the processor is operative to select an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin" as recited in claim 40 (emphasis added).

Claim 57 depends from claim 40 and is at least allowable for the same reasons as claim 40.

Claim 48 and its dependent claims

Claim 48 should be allowable for at least reasons similar to claim 4. In particular, the proposed combination fails to teach or suggest, "[a] computer program comprising the steps of: selecting a subset of active antennas from a plurality of available antennas in an multi-element antenna system based on higher-order statistics of a propagation medium; and selecting a constellation for transmission on the active antennas including selecting different constellations for two or more of the active antennas" as recited in claim 48 (emphasis added).

Claims 46, 49, 50, 52 and 54 depend from claim 48 and are allowable for at least the same reasons set forth above with respect to claim 48.

Claim 51

Claim 51 should be allowable for at least reasons similar to claim 7. In particular, the proposed combination fails to teach or suggest, "[a] computer program comprising the steps of: selecting a subset of active antennas from a plurality of available antennas in an multi-element antenna system based on higher-order statistics of a propagation medium where said selecting comprises selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin" as recited in claim 51 (emphasis added).

Claims 58 and 59

Claims 58 and 59 depend from allowed claims 42 and 44, respectively, and are believed to be in allowable form.

CONCLUSION

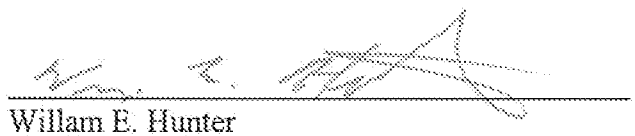
It is believed that all of the pending claims have been addressed in this paper. However, failure to address a specific rejection, issue, or comment, does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above are not intended to be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

All Claims should now be in condition for allowance, and a notice to that effect is respectfully solicited.

Please apply any required fees or any credits to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

Date: September 28, 2006



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